

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

**Attorney Docket No. 15258US05**

In the Application of:

Ahmadreza Rofougaran et al.

U.S. Serial No.: 09/699,019

Filed: October 27, 2000

For: ADAPTIVE RADIO TRANSCEIVER  
WITH A BANDPASS FILTER

Examiner: Marceau Milord

Group Art Unit: 2618

Confirmation No.: 5832

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/Michael T. Cruz/

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Reg. No. 44,636

**APPEAL BRIEF**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This paper is a timely Appeal Brief in support of a Notice of Appeal that was received by the United States Patent and Trademark Office on July 23, 2007.

A Petition for a Two-Month Extension of Time is enclosed, thereby extending the deadline by which to file an Appeal Brief to November 23, 2007.

### **REAL PARTY IN INTEREST**

Broadcom Corporation, a corporation organized under the laws of the state of California and having a place of business at 5300 California Avenue, Irvine, California 92617, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor.

### **RELATED APPEALS AND INTERFERENCES**

An appeal is pending in co-pending U.S. Patent Application No. 10/752,456. An appeal brief was filed on October 12, 2007.

An appeal brief was filed in co-pending U.S. Patent Application No. 09/634,552. In response to the appeal brief, the Examiner re-opened prosecution. Since the Examiner re-opened prosecution, the Board did not render a decision.

An appeal brief was filed in, now issued, U.S. Patent Application No. 09/695,715. In response to the appeal brief, the Examiner re-opened prosecution. Since the Examiner re-opened prosecution, the Board did not render a decision.

An appeal brief was filed in co-pending U.S. Patent Application No. 09/698,550. In response to the appeal brief, the Examiner re-opened prosecution. Since the Examiner re-opened prosecution, the Board did not render a decision.

An appeal brief was filed in, now issued, U.S. Patent Application No. 09/698,497. In response to the appeal brief, the Examiner re-opened prosecution. Since the Examiner re-opened prosecution, the Board did not render a decision.

An appeal brief was filed in, now issued, U.S. Patent Application No. 09/698,498. In response to the appeal brief, the Examiner re-opened prosecution. Since the Examiner re-opened prosecution, the Board did not render a decision.

An appeal brief was filed in, now issued, U.S. Patent Application No. 09/691,634. In response to the appeal brief, the Examiner re-opened prosecution. Since the Examiner re-opened prosecution, the Board did not render a decision.

### **STATUS OF THE CLAIMS**

Claims 1-66 are pending and are being prosecuted in the present application. Claims 2-11, 14-19, 36-45 and 47-53 are merely objected to. Claims 1, 12, 13, 20-35, 46 and 54-66 are rejected. The rejection of claims 1, 12, 13, 20-35, 46 and 54-66 is being appealed.

### **STATUS OF AMENDMENTS**

An Office Action Made Final was mailed on March 21, 2007. A Response to provoke an Advisory Action was filed on May 21, 2007. No amendments to the claims were made in the Response to provoke an Advisory Action. The Examiner mailed an Advisory Action on June 13, 2007.

### **SUMMARY OF CLAIMED SUBJECT MATTER**

Some embodiments according to some aspects of the present invention may provide a notch filter that may include, for example, a first polyphase filter and a second polyphase filter. The first polyphase filter may output a plurality of phases of an input signal including, for example, a first phase and an inverted first phase. The second polyphase filter may have an input that receives the inverted first phase and an inverted input to receive the first phase.

Some embodiments according to some aspects of the present invention may provide a notch filter that may include, for example, a first polyphase filter and a second polyphase filter. The first polyphase filter may include, for example, an input and an output. The output of the polyphase filter may include, for example, a non-inverted output and an inverted output. The second polyphase filter may include, for example, an input including, for example, a non-inverted and inverted input. The non-inverted output of the first polyphase filter may be coupled to the inverted input of the second polyphase filter. The inverted output of the first polyphase filter may be coupled to the non-inverted input of the second polyphase filter.

Some embodiments according to some aspects of the present invention may provide a notch filter that may include, for example, generating means and notching means. The generating means may generate an output signal including, for example, a plurality of phases of an input signal. The notching means may notch, for example, a particular frequency of the input signal as a function of the phases.

Some embodiments according to some aspects of the present invention may provide a circuit that may include, for example, a mixer and a polyphase filter. The mixer may have, for example, an output that may include, for example, a mixed signal output and an inverted mixed signal output. The polyphase filter may have, for example, an input including, for example, a non-inverted input and an inverted input. The non-inverted input may be coupled to the inverted mixed signal output. The inverted input may be coupled to the non-inverted mixed signal output.

Some embodiments according to some aspects of the present invention may provide a circuit that may include, for example, a first polyphase filter and a second polyphase filter. The first polyphase filter may have, for example, an output including, for example, a non-inverted output and an inverted output. The second polyphase filter may have, for example, an input including, for example, a non-inverted input and an inverted input. The non-inverted input of the second polyphase filter may be coupled to the inverted output of the first polyphase filter. The inverted input of the second polyphase filter may be coupled to the non-inverted output of the first polyphase filter.

Some embodiments according to some aspects of the present invention may provide a circuit that may include, for example, mixing means and filtering means. The mixing means may mix two signals and may output a mixed signal and an inverted mixed signal. The filtering means may notch a particular frequency of the mixed signal using a polyphase structure.

Some embodiments according to some aspects of the present invention may provide a circuit that may include, for example, first filtering means and second filtering means. The first filtering means may notch a first frequency of a signal using a first polyphase structure. The second filtering means may notch a second frequency of the

signal using a second polyphase structure. The second frequency may be different from the first frequency.

## **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Whether claims 1, 12, 13, 31-35, 46 and 54-66 are unpatentable under 35 U.S.C. § 103(a) as being obvious over United States Patent No. 6,020,783 to Theodore A. Coppola ("Coppola") in view of United States Patent No. 6,804,359 B1 to Li Yu et al. ("Yu").

Whether claims 20-30 are unpatentable under 35 U.S.C. § 102(b) as being anticipated by Coppola.

## **ARGUMENT**

### **I. CLAIM 1**

Claim 1 stands rejected under 35 U.S.C § 103(a) as being obvious over United States Patent No. 6,020,783 to Theodore A. Coppola ("Coppola") in view of United States Patent No. 6,804,359 B1 to Li Yu et al. ("Yu"). Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

#### **A. Coppola and Yu Do Not Teach Each and Every Element**

In view of claim 1 reciting, for example, a first polyphase filter and a second polyphase filter, the Examiner freely admits that Coppola does not teach the first polyphase filter and the second polyphase filter as set forth in claim 1.

Instead, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

While FIG. 8 of Yu does identify two blocks as polyphase filter 42 and polyphase filter 44, it must be pointed out that block 18 is not a notch filter. Instead, block 18 of FIG. 8 of Yu is "a signal mapping circuit 18 which is useful for the double sampled system". Yu at col. 5, lines 7-8.

So, the polyphase filters 42, 44 in Yu are **not** part of a notch filter. Instead, polyphase filters 42, 44 in Yu are part of a signal mapping circuit 18 – which is **not** a notch filter.

This is in contradistinction with claim 1 which recites, in part, a first polyphase filter and a second polyphase filter that are part of a notch filter.

Furthermore, in Yu, polyphase filters 42, 44 are not arranged as the first polyphase filter and the second polyphase filter in claim 1.

The Examiner has yet to carefully consider the arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 1. Note how the outputs the first polyphase filter are arranged with respect to the inputs of the second polyphase filter: “a first polyphase filter to output a plurality of phases of an input signal including a first phase and an inverted first phase; and a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase”. Note how the outputs of polyphase filter 42 are not arranged with respect to the inputs of polyphase filter 44 as set forth in claim 1.

It is respectfully submitted, for example, that the polyphase filters 42, 44 of Yu are not arranged so that, for example, “a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase”.

In fact, the outputs of polyphase filter 42 are not received by the inputs of polyphase filter 44; and the outputs of polyphase filter 44 are not received by the inputs of polyphase filter 42.

Thus, other than illustrating two polyphase filters 42, 44 in FIG. 8, Yu does not make up for the teaching deficiencies of Coppola. In other words, although Yu illustrates polyphase filters 42, 44, neither Coppola nor Yu, individually or combined, teaches the arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 1. See, e.g., claim 1 (“a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase”).

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 1 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 1.

**B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.

Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are part of a notch filter) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola’s notch filter paths 14, 20, 24 and Yu’s polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is applicable and it states that “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu.

**C. Coppola Teaches Away From the Claimed Invention of Claim 1**

Claim 1 recites, in part, “a first polyphase filter to output a plurality of phases of an input signal including a first phase and an inverted first phase; and a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase”.

M.P.E.P. § 2145(X)(D)(1) states “[a] prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

In view of M.P.E.P. § 2145(X)(D)(1), Appellants respectfully submit that Coppola teaches away from the claimed invention as set forth in claim 1.

According to M.P.E.P. § 2145(X)(D)(1), it should be considered a “significant factor” that Coppola teaches away from the claimed invention as set forth in claim 1 in determining that the subject matter recited in claim 1 is nonobvious.

Appellants respectfully draw the attention of the Board to FIG. 1 of Coppola. The Examiner may note that notch filter path 14 is in parallel with notch filter path 20 which is also in parallel with notch filter path 24.

The Background Section of Coppola explains why Coppola teaches parallel notch filter paths instead of series notch filter paths (namely, cascaded notch filter paths).

The network cascades the individual notch filters. Thus, in theory an incoming spectra passes through each of these notch filters with



each filter attenuating its corresponding frequency spectrum. However, the desired signals in the spectra also degrade as they pass through the successive filters.

Coppola at col. 1, lines 25-30.

Appellants now respectfully draw the attention of the Board to the recited elements as set forth in claim 1.

Note how the first polyphase filter is arranged with respect to the second polyphase filter.

Note how the inputs of the second polyphase filter receive the outputs of the first polyphase filter. See, e.g., claim 1 (“a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase”).

Such an arrangement is similar in at least some aspects with the cascaded notch filter paths since a signal passes through the first polyphase filter and then passes through the second polyphase filter as set forth in claim 1. In the Background Section of Coppola that Coppola specifically and directly disparages such an arrangement for degrading the desired signal by passing through each of the notch filter paths in series. See, e.g., Coppola at col. 1, lines 25-30.

Coppola would teach away from the notch filter as set forth in claim 1 since, according to the teachings of Coppola, the signal would have to pass through both the first polyphase filter and the second polyphase filter thereby twice degrading the desired signal.

Thus, Coppola teaches away from arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 1.

It is respectfully submitted that, since the teaching away of Coppola is a “significant factor” in the determination of obviousness, the obviousness rejection cannot be maintained based, at least in part, on Coppola.

For at least the above reasons, it is respectfully requested that the Board reverse the obviousness rejection based, at least in part, on Coppola with respect to claim 1.

#### **D. Conclusion**

It is respectfully submitted that any of the arguments in sections **IA**, **IB** or **IC** merits reversing the obviousness rejection.

It is respectfully submitted that the sum total of all the above arguments in sections **IA**, **IB** and **IC** is an even more substantial argument for the patentability of the subject matter as set forth in claim 1.

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claim 1.

## **II. CLAIMS 12 AND 13**

Claims 12 and 13 stand rejected under 35 U.S.C § 103(a) as being obvious over Coppola in view of Yu. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

### **A. Coppola and Yu Do Not Teach Each and Every Element**

In view of claim 12 reciting, for example, a first polyphase filter and a second polyphase filter, the Examiner freely admits that Coppola does not teach the first polyphase filter and the second polyphase filter as set forth in claim 12.

Instead, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

While FIG. 8 of Yu does identify two blocks as polyphase filter 42 and polyphase filter 44, it must be pointed out that block 18 is not a notch filter. Instead, block 18 is “a signal mapping circuit 18 which is useful for the double sampled system”. Yu at col. 5, lines 7-8.

So, the polyphase filters 42, 44 in Yu are **not** part of a notch filter. Instead, polyphase filters 42, 44 in Yu are part of a signal mapping circuit 18 – which is **not** a notch filter.

This is in contradistinction with claim 12 which recites, in part, a first polyphase filter and a second polyphase filter that are part of a notch filter.

Furthermore, in Yu, polyphase filters 42, 44 are not arranged as the first polyphase filter and the second polyphase filter in claim 12.

The Examiner has yet to carefully consider the arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 12. Note how the outputs the first polyphase filter are arranged with respect to the inputs of the second polyphase filter: “a first polyphase filter including an input, and an output having a non-inverted output and an inverted output; and a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the first polyphase filter being coupled to the non-inverted input of the second polyphase filter”. Note how the outputs of polyphase filter 42 are not arranged with respect to the inputs of polyphase filter 44 as set forth in claim 12.

It is respectfully submitted, for example, that the polyphase filters 42, 44 of Yu are not arranged so that, for example, “a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the first polyphase filter being coupled to the non-inverted input of the second polyphase filter”.

In fact, the outputs of polyphase filter 42 are not received by the inputs of polyphase filter 44; and the outputs of polyphase filter 44 are not received by the inputs of polyphase filter 42.

Thus, other than illustrating two polyphase filters 42, 44 in FIG. 8, Yu does not make up for the teaching deficiencies of Coppola. In other words, although Yu illustrates polyphase filters 42, 44, neither Coppola nor Yu, individually or combined, teaches the arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 12. See, e.g., claim 12 (“a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the

first polyphase filter being coupled to the non-inverted input of the second polyphase filter”).

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 12 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 12 and its rejected dependent claim (i.e., claim 13).

**B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.

Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are part of a notch filter) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing

degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola’s notch filter paths 14, 20, 24 and Yu’s polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is applicable and it states that “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu with respect to claim 12 and its rejected dependent claim (i.e., claim 13).

#### **C. Coppola Teaches Away From the Claimed Invention of Claim 12**

Claim 12 recites, in part, “a first polyphase filter including an input, and an output having a non-inverted output and an inverted output; and a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the first polyphase filter being coupled to the non-inverted input of the second polyphase filter”.

M.P.E.P. § 2145(X)(D)(1) states “[a] prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

In view of M.P.E.P. § 2145(X)(D)(1), Appellants respectfully submit that Coppola teaches away from the claimed invention as set forth in claim 12.

According to M.P.E.P. § 2145(X)(D)(1), it should be considered a “significant factor” that Coppola teaches away from the claimed invention as set forth in claim 12 in determining that the subject matter recited in claim 12 is nonobvious.

Appellants respectfully draw the attention of the Board to FIG. 1 of Coppola. The Examiner may note that notch filter path 14 is in parallel with notch filter path 20 which is also in parallel with notch filter path 24.

The Background Section of Coppola explains why Coppola teaches parallel notch filter paths instead of series notch filter paths (namely, cascaded notch filter paths).

The network cascades the individual notch filters. Thus, in theory an incoming spectra passes through each of these notch filters with each filter attenuating its corresponding frequency spectrum. However, the desired signals in the spectra also degrade as they pass through the successive filters.

Coppola at col. 1, lines 25-30.

Appellants now respectfully draw the attention of the Board to the recited elements as set forth in claim 12.

Note how the first polyphase filter is arranged with respect to the second polyphase filter.

Note how the inputs of the second polyphase filter receive the outputs of the first polyphase filter. See, e.g., claim 12 (“a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the first polyphase filter being coupled to the non-inverted input of the second polyphase filter”).

Such an arrangement is similar in at least some aspects with the cascaded notch filter paths since a signal passes through the first polyphase filter and then passes through the second polyphase filter as set forth in claim 12. In the Background Section of Coppola that Coppola specifically and directly disparages such an arrangement for degrading the desired signal by passing through each of the notch filter paths in series. See, e.g., Coppola at col. 1, lines 25-30.

Coppola would teach away from the notch filter as set forth in claim 12 since, according to the teachings of Coppola, the signal would have to pass through both the

first polyphase filter and the second polyphase filter thereby twice degrading the desired signal.

Thus, Coppola teaches away from arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 12.

It is respectfully submitted that, since the teaching away of Coppola is a “significant factor” in the determination of obviousness, the obviousness rejection cannot be maintained based, at least in part, on Coppola.

For at least the above reasons, it is respectfully requested that the Board reverse the obviousness rejection based, at least in part, on Coppola with respect to claim 12 and its rejected dependent claim (i.e., claim 13).

#### **D. Conclusion**

It is respectfully submitted that any of the arguments in sections **IIA**, **IIB** or **IIC** merits reversing the obviousness rejection with respect to claims 12 and 13.

It is respectfully submitted that the sum total of all the above arguments in sections **IIA**, **IIB** and **IIC** is an even more substantial argument for the patentability of the subject matter as set forth in claims 12 and 13.

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claims 12 and 13.

### **III. CLAIMS 31-35**

Claims 31-35 stand rejected under 35 U.S.C § 103(a) as being obvious over Coppola in view of Yu. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

#### **A. Coppola and Yu Do Not Teach Each and Every Element**

Claim 31 recites, in part, “a mixer having an output including a mixed signal output and an inverted mixed signal output”. In support of his rejection, the Examiner cites “22 of fig. 1; col. 2, line 61-col. 3, line 9; col. 3, lines 18-44; col. 4, lines 42-52”. Component 22 in FIG. 1 of Coppola is a bandpass filter. A bandpass filter is not a mixer.

Accordingly, although alleged by the Examiner, Coppola does teach “a mixer having an output including a mixed signal output and an inverted mixed signal output”.

Claim 31 also recites, in part, “a polyphase filter having an input including a non-inverted input coupled to the inverted mixed signal output, and an inverted input coupled to the non-inverted mixed signal output”.

The Examiner freely admits that Coppola does not teach a polyphase filter as set forth in claim 31. Nevertheless, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

While FIG. 8 of Yu does illustrate polyphase filters 42, 44. Yu does not teach “a polyphase filter having an input including a non-inverted input coupled to the inverted mixed signal output, and an inverted input coupled to the non-inverted mixed signal output”.

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 31 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 31 and its rejected dependent claims (i.e., claims 32-35) .

**B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.



Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are part of a notch filter) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola’s notch filter paths 14, 20, 24 and Yu’s polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is applicable and it states that “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu with respect to claim 31 and its rejected dependent claims (i.e., claim 32-35).

### **C. Conclusion**

It is respectfully submitted that any of the arguments in sections IIIA or IIIB merits reversing the obviousness rejection with respect to claims 31-35.

It is respectfully submitted that the sum total of all the above arguments in sections IIIA and IIIB is an even more substantial argument for the patentability of the subject matter as set forth in claims 31-35.

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claims 31-35.

#### **IV. CLAIM 46**

Claim 46 stands rejected under 35 U.S.C § 103(a) as being obvious over Coppola in view of Yu. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

##### **A. Coppola and Yu Do Not Teach Each and Every Element**

In view of claim 46 reciting, for example, a first polyphase filter and a second polyphase filter, the Examiner freely admits that Coppola does not teach the first polyphase filter and the second polyphase filter as set forth in claim 46.

Instead, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

Although Yu does illustrate two polyphase filters 42, 44 in FIG. 8, the polyphase filters 42, 44 are not arranged as the first polyphase filter and the second polyphase filter as set forth in claim 46.

The Examiner has yet to carefully consider the arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 46. Note how the outputs of the first polyphase filter are arranged with respect to the inputs of the second polyphase filter: “a first polyphase filter having an output including a non-inverted output and an inverted output; and a second polyphase filter having an input including a non-inverted input coupled to the inverted output of the first polyphase filter and an inverted input coupled to the non-inverted output of the first polyphase filter”. Note how the outputs of polyphase filter 42 are not arranged with respect to the inputs of polyphase filter 44 as set forth in claim 46.

It is respectfully submitted, for example, that the polyphase filters 42, 44 of Yu are not arranged so that, for example, “a second polyphase filter having an input including a non-inverted input coupled to the inverted output of the first polyphase filter and an inverted input coupled to the non-inverted output of the first polyphase filter”.

In fact, the outputs of polyphase filter 42 are not received by the inputs of polyphase filter 44; and the outputs of polyphase filter 44 are not received by the inputs of polyphase filter 42.

Thus, other than illustrating two polyphase filters 42, 44 in FIG. 8, Yu does not make up for the teaching deficiencies of Coppola. In other words, although Yu illustrates polyphase filters 42, 44, neither Coppola nor Yu, individually or combined, teaches the arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 46. See, e.g., claim 46 (“a second polyphase filter having an input including a non-inverted input coupled to the inverted output of the first polyphase filter and an inverted input coupled to the non-inverted output of the first polyphase filter”).

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 46 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 46.

#### **B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of

Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.

Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are part of a notch filter) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola’s notch filter paths 14, 20, 24 and Yu’s polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is applicable and it states that “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu.

### **C. Coppola Teaches Away From the Claimed Invention of Claim 46**

Claim 46 recites, in part, “a first polyphase filter having an output including a non-inverted output and an inverted output; and a second polyphase filter having an input including a non-inverted input coupled to the inverted output of the first polyphase filter

and an inverted input coupled to the non-inverted output of the first polyphase filter”.

M.P.E.P. § 2145(X)(D)(1) states “[a] prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

In view of M.P.E.P. § 2145(X)(D)(1), Appellants respectfully submit that Coppola teaches away from the claimed invention as set forth in claim 46.

According to M.P.E.P. § 2145(X)(D)(1), it should be considered a “significant factor” that Coppola teaches away from the claimed invention as set forth in claim 46 in determining that the subject matter recited in claim 46 is nonobvious.

Appellants respectfully draw the attention of the Board to FIG. 1 of Coppola. The Examiner may note that filter path 14 is in parallel with filter path 20 which is also in parallel with filter path 24.

The Background Section of Coppola explains why Coppola teaches parallel filter paths instead of series filter paths (namely, cascaded filter paths).

The network cascades the individual notch filters. Thus, in theory an incoming spectra passes through each of these notch filters with each filter attenuating its corresponding frequency spectrum. However, the desired signals in the spectra also degrade as they pass through the successive filters.

Coppola at col. 1, lines 25-30.

Appellants now respectfully draw the attention of the Board to the recited elements as set forth in claim 46.

Note how the first polyphase filter is arranged with respect to the second polyphase filter.

Note how the inputs of the second polyphase filter receive the outputs of the first polyphase filter. See, e.g., claim 46 (“a second polyphase filter having an input including a non-inverted input coupled to the inverted output of the first polyphase filter and an inverted input coupled to the non-inverted output of the first polyphase filter”).

Such an arrangement is similar in at least some aspects with the cascaded filter paths since a signal passes through the first polyphase filter and then passes through the

second polyphase filter as set forth in claim 46. In the Background Section of Coppola that Coppola specifically and directly disparages such an arrangement for degrading the desired signal by passing through each of the notch filter paths in series. See, e.g., Coppola at col. 1, lines 25-30.

Coppola would teach away from the filter arrangement as set forth in claim 46 since, according to the teachings of Coppola, the signal would have to pass through both the first polyphase filter and the second polyphase filter thereby twice degrading the desired signal.

Thus, Coppola teaches away from arrangement of the first polyphase filter and the second polyphase filter as set forth in claim 46.

It is respectfully submitted that, since the teaching away of Coppola is a “significant factor” in the determination of obviousness, the obviousness rejection cannot be maintained based, at least in part, on Coppola.

For at least the above reasons, it is respectfully requested that the Board reverse the obviousness rejection based, at least in part, on Coppola with respect to claim 46.

#### **D. Conclusion**

It is respectfully submitted that any of the arguments in sections **IVA**, **IVB** or **IVC** merits reversing the obviousness rejection.

It is respectfully submitted that the sum total of all the above arguments in sections **IVA**, **IVB** and **IVC** is an even more substantial argument for the patentability of the subject matter as set forth in claim 46.

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claim 46.

#### **V. CLAIMS 54-58**

Claims 54-58 stand rejected under 35 U.S.C § 103(a) as being obvious over Coppola in view of Yu. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

##### **A. Coppola and Yu Do Not Teach Each and Every Element**

Claim 54 recites, in part, “mixing means for mixing two signals and outputting a mixed signal and an inverted mixed signal; and filtering means for notching a particular frequency of the mixed signal using a polyphase structure”. In support of his rejection, the Examiner cites “22 of fig. 1; col. 2, line 61-col. 3, line 9; col. 3, lines 18-44; col. 4, lines 42-52”. Component 22 in FIG. 1 of Coppola is a bandpass filter. A bandpass filter is not a mixing means.

Accordingly, although alleged by the Examiner, Coppola does teach “mixing means for mixing two signals and outputting a mixed signal and an inverted mixed signal”.

Claim 54 also recites, in part, “filtering means for notching a particular frequency of the mixed signal using a polyphase structure”.

The Examiner freely admits that Coppola does not teach notching using a polyphase structure as set forth in claim 54. Nevertheless, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

While FIG. 8 of Yu does illustrate polyphase filters 42, 44. However, the polyphase filters 42, 44 are not used for notching. Instead, block 18 of FIG. 8 is “a signal mapping circuit 18 which is useful for the double sampled system”. Yu at col. 5, lines 7-8.

So, the polyphase filters 42, 44 in Yu are **not** used for notching. Instead, polyphase filters 42, 44 in Yu are part of a signal mapping circuit 18 – which is **not** used for notching.

Accordingly, Yu does not teach “filtering means for notching a particular frequency of the mixed signal using a polyphase structure”.

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 54 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 54 and its rejected dependent claims (i.e., claims 55-58).

**B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.

Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are “for notching”) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola’s notch filter paths 14, 20, 24 and Yu’s polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is



applicable and it states that “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu with respect to claim 54 and its rejected dependent claims (i.e., claim 55-58).

### **C. Conclusion**

It is respectfully submitted that any of the arguments in sections VA, VB or VC merits reversing the obviousness rejection with respect to claims 54-58.

It is respectfully submitted that the sum total of all the above arguments in sections VA, VB and VC is an even more substantial argument for the patentability of the subject matter as set forth in claims 54-58.

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claims 54-58.

## **VI. CLAIMS 59-61**

Claim 59-61 stand rejected under 35 U.S.C § 103(a) as being obvious over Coppola in view of Yu. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

### **A. Coppola and Yu Do Not Teach Each and Every Element**

Claim 59 recites, in part, “first filtering means for notching a first frequency of a signal using a first polyphase structure; and second filtering means for notching a second frequency of the signal using a second polyphase structure”.

The Examiner freely admits that Coppola does not teach notching using a first polyphase structure and notching using a second polyphase structure as set forth in claim 59.

Instead, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

While FIG. 8 of Yu does identify two blocks as polyphase filter 42 and polyphase filter 44, it must be pointed out that block 18 is not used for notching. Instead, block 18 is “a signal mapping circuit 18 which is useful for the double sampled system”. Yu at col. 5, lines 7-8.

So, the polyphase filters 42, 44 in Yu are **not** used for notching. Instead, polyphase filters 42, 44 in Yu are part of a signal mapping circuit 18 – which is **not** used for notching.

This is in contradistinction with claim 59 which recites, for example, first filtering means for notching a first frequency of a signal using a first polyphase structure and second filtering means for notching a second frequency of the signal using a second polyphase structure.

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 59 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 59 and its rejected dependent claims (i.e., claims 60 and 61).

**B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of

Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.

Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are used for notching) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola’s notch filter paths 14, 20, 24 and Yu’s polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is applicable and it states that “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu.

### **C. Conclusion**

It is respectfully submitted that any of the arguments in sections VIA or VIB merits reversing the obviousness rejection.

It is respectfully submitted that the sum total of all the above arguments in sections VIA and VIB is an even more substantial argument for the patentability of the subject matter as set forth in claim 59 and its rejected dependent claims (i.e., claims 60 and 61).

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claim 59 and its rejected dependent claims (i.e., claims 60 and 61).

## **VII. CLAIMS 62-66**

Claims 62-66 stand rejected under 35 U.S.C § 103(a) as being obvious over Coppola in view of Yu. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

### **A. Coppola and Yu Do Not Teach Each and Every Element**

Claim 62 recites, for example, “notching a particular frequency of the signal using a polyphase structure”. The Examiner freely admits that Coppola does not teach notching using a polyphase structure as set forth in claim 62.

Instead, the Examiner alleges that Yu makes up for the teaching deficiencies of Coppola. Appellants respectfully submit that Yu does not make up for the teaching deficiencies of Coppola.

While FIG. 8 of Yu does identify two blocks as polyphase filter 42 and polyphase filter 44, it must be pointed out that block 18 is **not** notching using a polyphase structure. Instead, block 18 is “a signal mapping circuit 18 which is useful for the double sampled system”. Yu at col. 5, lines 7-8.

So, the polyphase filters 42, 44 in Yu are **not** notching using a polyphase structure. Instead, polyphase filters 42, 44 in Yu are part of a signal mapping circuit 18 – which is **not** notching using a polyphase structure.

This is in contradistinction with claim 62 which recites, in part, notching a particular frequency of the signal using a polyphase structure.

Since Yu does not make up for the teaching deficiencies of Coppola, the obviousness rejection with respect to claim 62 cannot be maintained.

It is respectfully requested that the obviousness rejection be reversed with respect to claim 62 and its dependent claims (i.e., claims 63-66).

**B. Yu Teaches Away from Coppola**

M.P.E.P. § 2145(X)(D)(2) states “[i]t is improper to combine references where the references teach away from their combination”. M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

Accordingly, it is respectfully submitted that Yu and Coppola were improperly combined and that an obviousness rejection based on the improper combination of Yu and Coppola cannot be maintained.

Recall that object of the invention in Coppola is to “handle multiple undesired frequency spectra without degrading any desired spectra”. Coppola at col. 2, lines 37-39. As noted previously, Coppola uses parallel notch filter paths 14, 20, 24 (e.g., FIG. 1 of Coppola) instead of series notch filter paths to minimize the degradation of any desired spectra.

Yu specifically and directly teaches away from the approach that Coppola teaches. Yu teaches polyphase filters 42, 44 that output a signal with a small amount of undesirable signal content and a large amount of undesirable signal content. See, e.g., Yu at col. 6, lines 6-7. The Summary of the Invention section of Yu describes this as “exaggerating the undesirable signal content”. See, e.g., Yu at col. 2, lines 54-55. Yu describes these two sets of signals as “signals with a small amount of noise” and “signals with a large amount of noise”. See, e.g., Yu at col. 4, lines 17-20.

Thus, instead of minimizing undesirable content, the polyphase filters 42, 44 (which the Examiner alleges are part of a notch filter) actually provide for “exaggerating the undesirable signal content”. Yu at col. 2, lines 54-55. Thus, instead of minimizing degradation of the desired spectra, Yu teaches polyphase filters 42, 44 that “[exaggerate] the undesirable signal content”.

It appears that the purposes of Coppola's notch filter paths 14, 20, 24 and Yu's polyphase filters 42, 44 are contradictory.

Since Coppola and Yu teach away from each other, Coppola and Yu cannot be properly combined. It is respectfully submitted that M.P.E.P. § 2145(X)(D)(2) is applicable and it states that "[i]t is improper to combine references where the references teach away from their combination". M.P.E.P. at page 2100-161 (Rev. 5, August 2006).

It is respectfully submitted that an obviousness rejection cannot be maintained base, at least in part, on Coppola and Yu.

It is therefore respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) as being based upon the improper combination of Coppola and Yu.

### **C. Conclusion**

It is respectfully submitted that any of the arguments in sections **VIIA** or **VIIIB** merits reversing the obviousness rejection.

It is respectfully submitted that the sum total of all the above arguments in sections **VIIA** and **VIIIB** is an even more substantial argument for the patentability of the subject matter as set forth in claim 62 and its rejected dependent claims (i.e., claims 63-66).

It is respectfully requested that the Board reverse the obviousness rejection under 35 U.S.C. § 103(a) with respect to claim 62 and its rejected dependent claims (i.e., claims 63-66).

### **VIII. CLAIMS 20-30**

Claims 20-30 stand rejected under 35 U.S.C § 102(B) as being anticipated by Coppola. Appellants respectfully request that the Board reverse the rejection for at least the reasons as set forth below.

Claim 20 recites "generating means for generating an output signal comprising a plurality of phases of an input signal".

On the other hand, Coppola describes that the output of each notch filter path 14, 20, 24 is a signal that is always 180 degrees out of phase with the undesired spectrum.

Coppola states “[h]ence, the phase shift circuits 40 and 41 provide a simple and efficient means for maintaining the 180° out-of-phase relationship between an undesired spectrum and the mirrored spectrum from a notch filter path”.

Accordingly, the notch filter 14 in Coppola does not have an output signal comprising a plurality of phases, but instead has an output signal with only *one* phase, namely, a 180° out-of-phase relationship.

Thus, Coppola does not describe each and every element as set forth in claim 20. For at least the above reasons, it is respectfully requested that the Board reverse the anticipation rejection with respect to claim 20 and its rejected dependent claims (i.e., claims 21-25).

Claim 20 also recites “notching means for notching a particular frequency of the input **as a function of the phases**” (bold added). On the other hand, Coppola does not describe notching a particular frequency as a function of the phases.

Since Coppola does not describe each and every element as set forth in claim 20, Coppola does not anticipate claim 20 and its rejected dependent claims (i.e., claims 21-25).

Thus, Coppola does not describe each and every element as set forth in claim 20. For at least the above reasons, it is respectfully requested that the Board reverse the anticipation rejection with respect to claim 20 and its rejected dependent claims (i.e., claims 21-25).

Claim 26 recites “generating an output signal comprising a plurality of phases of an input signal; and notching the particular frequency of the input signal as a function of the phases”.

Accordingly, the same or similar arguments, if applicable, are made with respect to claim 26 as were made with respect to claim 20.

Thus, Coppola does not describe each and every element as set forth in claim 26. For at least the above reasons, it is respectfully requested that the Board reverse the

In Support of Notice of Appeal received by USPTO on July 23, 2007

anticipation rejection with respect to claim 26 and its rejected dependent claims (i.e., claims 27-30).

## **IX. CONCLUSION**

For the foregoing reasons, it is believed that claims 1-66 are patentable over the alleged prior art of record. Reversal of the Examiner's rejection of claims 1, 12, 13, 20-35 and 54-66 is therefore respectfully requested, thereby placing claims 1-66 in condition for allowance. Accordingly, issuance of a patent on the application is therefore respectfully requested.

The Commissioner is hereby authorized to charge any additional fees, to charge any fee deficiencies or to credit any overpayments to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Dated: November 23, 2007

Respectfully submitted,

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## **CLAIMS APPENDIX**

The following claims are involved in this appeal:

1. A notch filter, comprising:

a first polyphase filter to output a plurality of phases of an input signal including a first phase and an inverted first phase; and

a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase.

12. A notch filter, comprising:

a first polyphase filter including an input, and an output having a non-inverted output and an inverted output; and

a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the first polyphase filter being coupled to the non-inverted input of the second polyphase filter.

13. The notch filter of claim 12 wherein the input to the first polyphase filter comprises a differential input.

20. A notch filter, comprising:

generating means for generating an output signal comprising a plurality of phases

of an input signal; and

notching means for notching a particular frequency of the input signal as a function of the phases.

21. The notch filter of claim 20 wherein the input signal comprises a differential signal.

22. The notch filter of claim 20 wherein the generating means further comprises means for generating the output signal with quadrature outputs when the input signal includes the particular frequency.

23. The notch filter of claim 22 wherein the notching means comprising means for rejecting the quadrature signal at the particular frequency.

24. The notch filter of claim 23 wherein the particular frequency is an odd harmonic of the input signal.

25. The notch filter of claim 24 wherein the particular frequency is a third harmonic of the input signal.

26. A method of notching a particular frequency of a signal, comprising:  
generating an output signal comprising a plurality of phases of an input signal;

and

notching the particular frequency of the input signal as a function of the phases.

27. The method of claim 26 wherein the generation of the output signal comprises generating the output signal with quadrature outputs when the input signal includes the particular frequency.

28. The method of claim 27 wherein the notching of the particular frequency comprises rejecting the quadrature signal at the particular frequency.

29. The method of claim 28 wherein the particular frequency is an odd harmonic of the input signal.

30. The method of claim 29 wherein the particular frequency is a third harmonic of the input signal.

31. A circuit, comprising:

a mixer having an output including a mixed signal output and an inverted mixed signal output; and

a polyphase filter having an input including a non-inverted input coupled to the inverted mixed signal output, and an inverted input coupled to the non-inverted mixed signal output.

32. The circuit of claim 31 wherein the mixer output comprises an in-phase component, an inverted in-phase component, a quadrature component and an inverted quadrature component, the mixed signal output comprising one of the in-phase and quadrature components, and the inverted mixed signal output comprising one of the inverted in-phase and inverted quadrature components.

33. The circuit of claim 32 wherein the mixed signal output comprises the quadrature component and the inverted mixed signal output comprises the inverted quadrature component.

34. The circuit of claim 31 wherein the polyphase filter comprises an output having a notch at a particular frequency.

35. The circuit of claim 34 wherein the polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at the particular frequency

46. A circuit, comprising:  
a first polyphase filter having an output including a non-inverted output and an inverted output; and  
a second polyphase filter having an input including a non-inverted input coupled

to the inverted output of the first polyphase filter and an inverted input coupled to the non-inverted output of the first polyphase filter.

54. A circuit, comprising:

mixing means for mixing two signals and outputting a mixed signal and an inverted mixed signal; and

filtering means for notching a particular frequency of the mixed signal using a polyphase structure.

55. The circuit of claim 54 wherein the polyphase structure comprises means for generating a zero at the particular frequency

56. The circuit of claim 54 further comprising a second filtering means for notching a second frequency of the mixed signal using a second polyphase structure, the second frequency being different from the first frequency.

57. The circuit of claim 56 wherein the polyphase structure comprises means for generating a zero at the particular frequency, and the second polyphase structure comprises means for generating a second zero at the second frequency.

58. The circuit of claim 57 further comprising a third filtering means for attenuating frequencies above a third frequency of the mixed signal, the third frequency

being higher than the particular and second frequencies.

59. A circuit, comprising:

first filtering means for notching a first frequency of a signal using a first polyphase structure; and

second filtering means for notching a second frequency of the signal using a second polyphase structure, the second frequency being different from the first frequency.

60. The circuit of claim 59 wherein the first polyphase structure comprises means for generating a first zero at the first frequency, and the second polyphase structure comprises means for generating a second zero at the second frequency.

61. The circuit of claim 59 further comprising a third filtering means for attenuating frequencies above a third frequency of the signal, the third frequency being higher than the second frequency.

62. A method of filtering a signal comprising notching a particular frequency of the signal using a polyphase structure.

63. The method of claim 62 wherein the notching of the particular frequency comprises generating a zero at the particular frequency using the polyphase structure.

64. The method of claim 62 further comprising notching a second frequency of the signal using a second polyphase structure, the second frequency being different from the first frequency.

65. The method of claim 64 wherein the notching of the particular frequency comprises generating a zero at the particular frequency using the polyphase structure, and the notching of the second frequency comprises generating a second zero at the second frequency using the second polyphase structure.

66. The method of claim 64 further comprising attenuating frequencies above a third frequency of the mixed signal, the third frequency being higher than the particular and second frequencies.

U.S. Application No. 09/699,019, filed October 27, 2000

Attorney Docket No. 15258US05

Appeal Brief dated November 23, 2007

In Support of Notice of Appeal received by USPTO on July 23, 2007

## **EVIDENCE APPENDIX**

None.



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## **RELATED PROCEEDINGS APPENDIX**

None.